INSTRUCTION BOOK

FOR

RADIO RECEIVER R-206A/PR

Lear RM402C

Learavian 402C

Manufactured by

LEAR, INCORPORATED

110 Ionia Ave., N.W.

Grand Rapids 2, Michigan

Order No. 11919-Phila-47

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DEMOLITION TO PREVENT ENEMY USE

WHY — To prevent the enemy from using or salvaging this equipment.

WHEN — When ordered by your commander.

HOW — 1. Smash — Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.

2. Cut — Use axes, handaxes, machetes.
3. Burn — Use gasoline, kerosene, oil, flame throwers, incendiary grenades.
4. Explosives — Use firearms, grenades, TNT.
5. Disposal — Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

WHAT — 1. Smash — Cabinet, whip antenna, receiver chassis, tubes, batteries.

2. Cut — Power cable, battery cables, loop wires, grid cap wires.
3. Burn — Loop frame, cabinet, speaker.
4. Bend — Plates of variable tuning capacitor.
5. Bury or scatter — All of the above pieces after destroying their usefulness.

DESTROY EVERYTHING

Figure 1. Radio Receiver R-206A/PR.

Note. This instruction book will be replaced by TM 11-5011, which, when published, will be listed in FM 21-6.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This instruction book provides instructions for the operation and maintenance of Radio Receiver R-206A/PR (fig. 1). In addition to this information three appendixes are included which cover information pertaining to shipment and storage, references, and the identification table of parts.

b. Part numbers appearing in the instruction book are from pamphlets of the Department of the Army Supply Catalog as listed in appendix III.

c. This instruction book does not contain copyright material.

2. Forms and Records

a. FORMS. The following forms are used in reporting operations and maintenance of the equipment:

WD AGO Form 468, Unsatisfactory Equipment Report

AAF Form 54, Unsatisfactory Report

(1) *WD AGO Form 468 (War Department Unsatisfactory Equipment Report) for equipment used by Army field forces and technical services.* When trouble occurs more often than is normal, as determined by qualified repair personnel, WD AGO Form 468 will be filled out and forwarded through channels to the Office of the Chief Signal Officer, Washington 25, D.C.

(2) *AAF Form 54 (Unsatisfactory Report) for equipment used by Department of the Air Force.* AAF Form 54 will be filled out and forwarded to Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio, in accordance with AAF Regulation 15-54.

b. OTHER FORMS AND RECORDS. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. Use and Capability

Radio Receiver R-206A/PR (fig. 1) is a portable a-m (amplitude-modulated) communications receiver which covers three tuning ranges (195 to 410 kc (kilocycles), 540 to 1,560 kc, and 2,200 to 6,200 kc) in three bands. It is designed to operate from a 105- to 125-volt, 50/60 cycle a-c (alternating-current) power supply, from a 105- to 125-volt d-c (direct-current) power supply, or from self-contained dry batteries. A collapsible whip antenna (fig. 2) may be used on all three bands or a self-contained loop antenna (fig. 4) may be used on the two lower-frequency bands, 1 and 2. Either built-in speaker or a headset may be used for listening; a panel-mounted jack is provided for a headset. A panel-mounted meter jack (fig. 2) provides a means of taking field-strength measurements. With an appropriate meter plugged into the jack (par. 12 f), the receiver may be used to check the A-N signals of a radio range.

4. Table of Components

a. The dimensions and weight of the equipment constituting Radio Receiver R-206A/PR are shown in the following table:

Component	Height (in.)	Depth (in.)	Length (in.)	Weight (lb)
Radio Receiver R-206A/PR, complete with tubes, less batteries.	8½	6	12	9¾
Whip antenna.	128¾ (extended) 17⅜ (collapsed)			¾

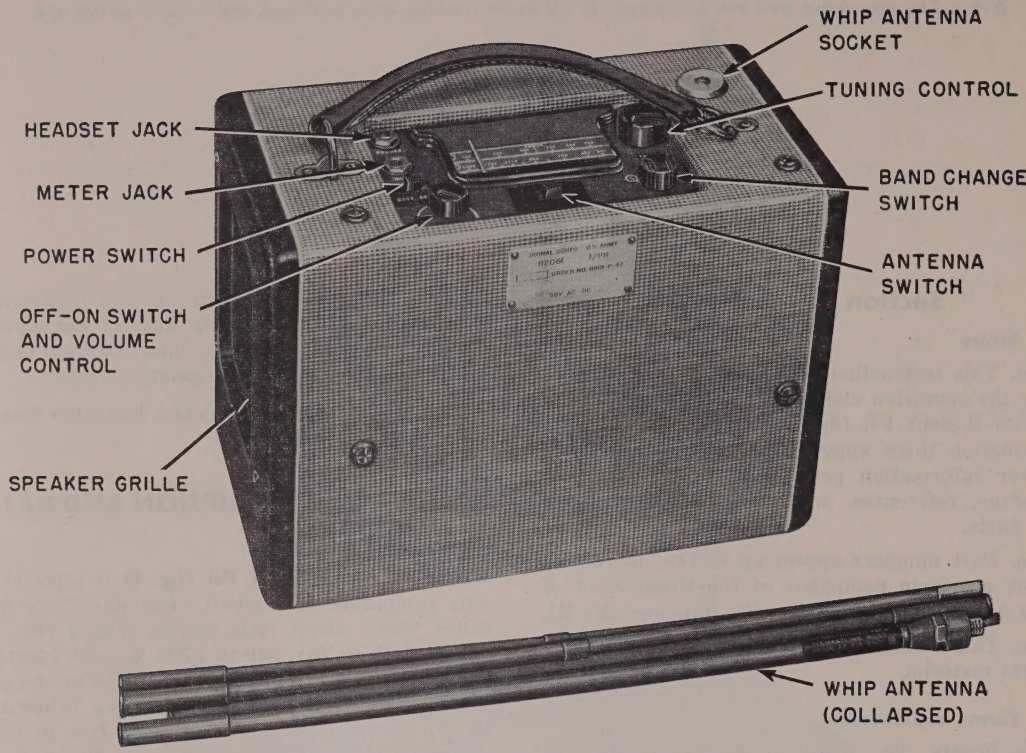


Figure 2. Radio Receiver R-206A/PR, front view. TM 5011-2

b. The physical characteristics of the equipment, the panel layout, and the location and accessibility of components within the cabinet are shown in figures 1, 2, 4, 5, and 6.

5. Performance Characteristics

Subparagraphs a through k below outline the technical and performance characteristics of Radio Receiver R-206A/PR.

a. Frequency range	Band No. 1 — 195 — 410 kc Band No. 2 — 540 — 1,560 kc Band No. 3 — 2,200 — 6,200 kc
b. Receiver type	Superheterodyne
c. Types of signals which can be received	A2 — Modulated telegraphy (a-m tone) A3 — Telephony (a-m voice)
d. Number of tubes	7
e. Tube complement	Type 1N5GT R-f (radio-frequency) amplifier Type 1A7GT Converter Type 1N5GT I-f (intermediate-frequency) amplifier Type 1H5GT Detector—a-f (audio-frequency) amplifier Type 1A5GT Power amplifier (battery operation) Type 50B5 Power amplifier (a-c — d-c operation) Type 35W4 Rectifier (a-c — d-c operation)

f. Intermediate frequency ..... 455 kc

g. Antenna ..... Whip: Bands No. 1, 2, and 3
Loop: Bands No. 1 and 2 only

h. Sensitivity (for 50 mw (milliwatts) output on a-c operation) ..... Whip: Band No. 1 — 20 microvolts
Band No. 2 — 15 microvolts
Band No. 3 — 15 microvolts

Loop: Band No. 1 — 100 microvolts per meter
Band No. 2 — 200 microvolts per meter

i. Power input ..... 40 watts (ac or dc)

j. Power output ..... 50 mw on battery operation
0.5 watts on a-c or d-c operation

k. Power supply requirements ..... A-c: 105- to 125-volt, 50/60-cycle
D-c: 105- to 125-volt
Battery: One 7½-volt A (Ray-O-Vac P-85-A or equal)
Two 45-volt B (SIG C type BA-63)

6. Packaging Data for Export Shipment

Radio Receiver R-206A/PR is shipped in one case, as shown in figure 3. The dimensions, weight, and volume of the packaged equipment are shown in the following table:

Component	Number of packages	Dimensions of each package			Weight of each package (lb)	Volume of each package (cu ft)
		Height (in.)	Depth (in.)	Length (in.)		
Radio Receiver: R-206A/PR, complete with tubes, less batteries, with whip antenna.	1	16½	10½	22½	21½ (approx)	2¼

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

7. Service Necessary for New Equipment

a. UNCRATING, UNPACKING, AND CHECKING. Be extremely careful when unpacking or handling the equipment because it may be damaged easily when not protected by the packing case. Do not apply pressure to the dial cover face. In unpacking the receiver, refer to figure 3 and follow the steps outlined below.

(1) Remove the nails with a nail-puller, and remove the top of the packing case. *Prying off the*

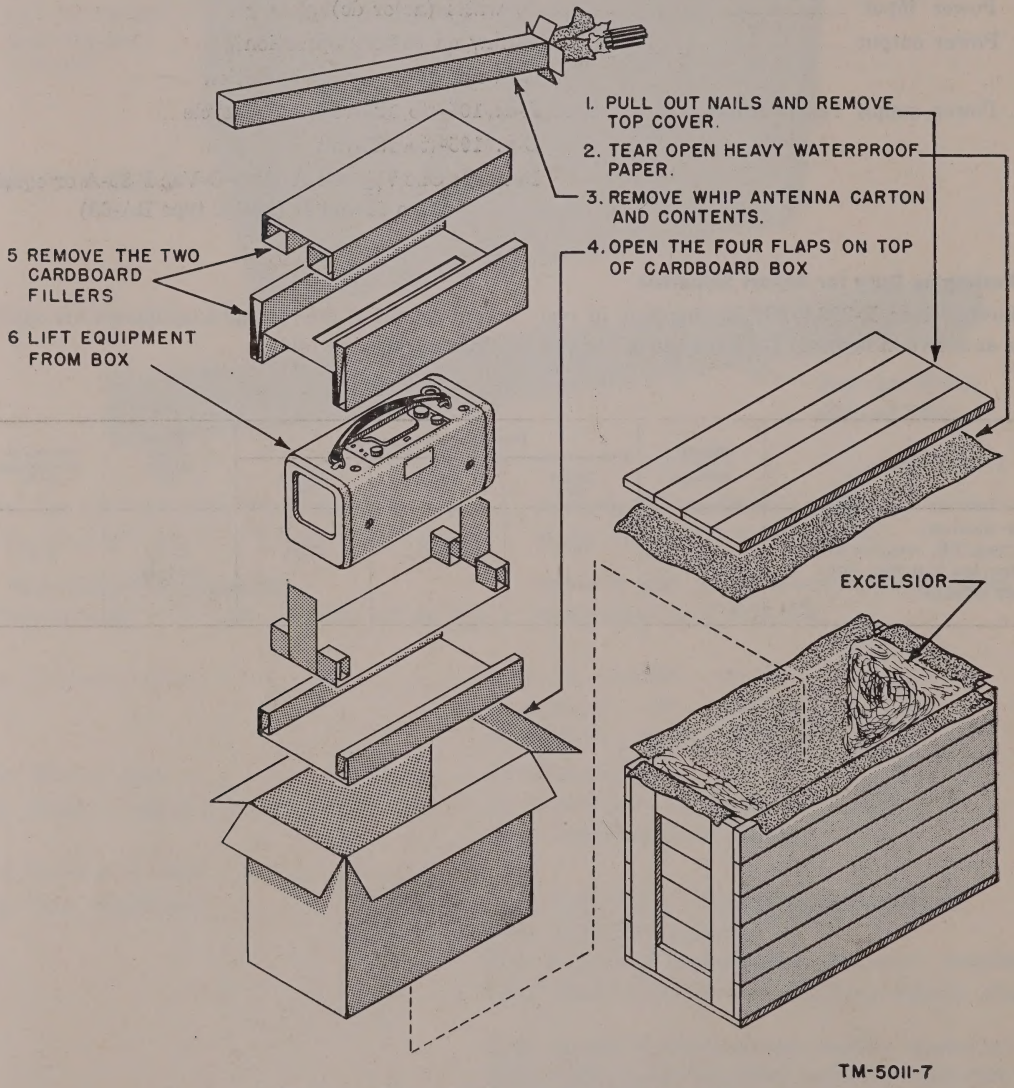

1. PULL OUT NAILS AND REMOVE TOP COVER.
2. TEAR OPEN HEAVY WATERPROOF PAPER.
3. REMOVE WHIP ANTENNA CARTON AND CONTENTS.
4. OPEN THE FOUR FLAPS ON TOP OF CARDBOARD BOX
5 REMOVE THE TWO CARDBOARD FILLERS
6 LIFT EQUIPMENT FROM BOX
EXCELSIOR
TM-5011-7

Figure 3. Radio Receiver R-206A/PR, unpacking instructions.

top may result in damage to the equipment. (See fig. 3.)

(2) Tear open the protective wrappings.

(3) Remove the cardboard cartons containing the whip antenna and the receiver.

(4) After removing the equipment from the packing case, inspect it visually for damage, and check the components against the master packing slip.

b. INSTALLATION OF BATTERY.

Caution: Be sure receiver is turned off (volume control knob turned completely counterclockwise).

(1) Remove the back of the cabinet by removing the four screws which hold the back in place.

(2) Remove the loop antenna and swing it to one side, as shown in figure 4.

(3) Place the batteries in the cabinet as shown in figure 7, replace the loop antenna, and secure the back of the cabinet with the four screws.

c. WHIP ANTENNA INSTALLATION. (1) Extend the collapsible whip antenna so that each section will telescope properly at joining sections.

(2) Screw the base of the whip into the antenna socket on top of the receiver unit. Turn clockwise until tight.

8. Service Necessary for Used Equipment

Note. The instructions and precautions for used and/or reconditioned equipment are the same as for new equipment.

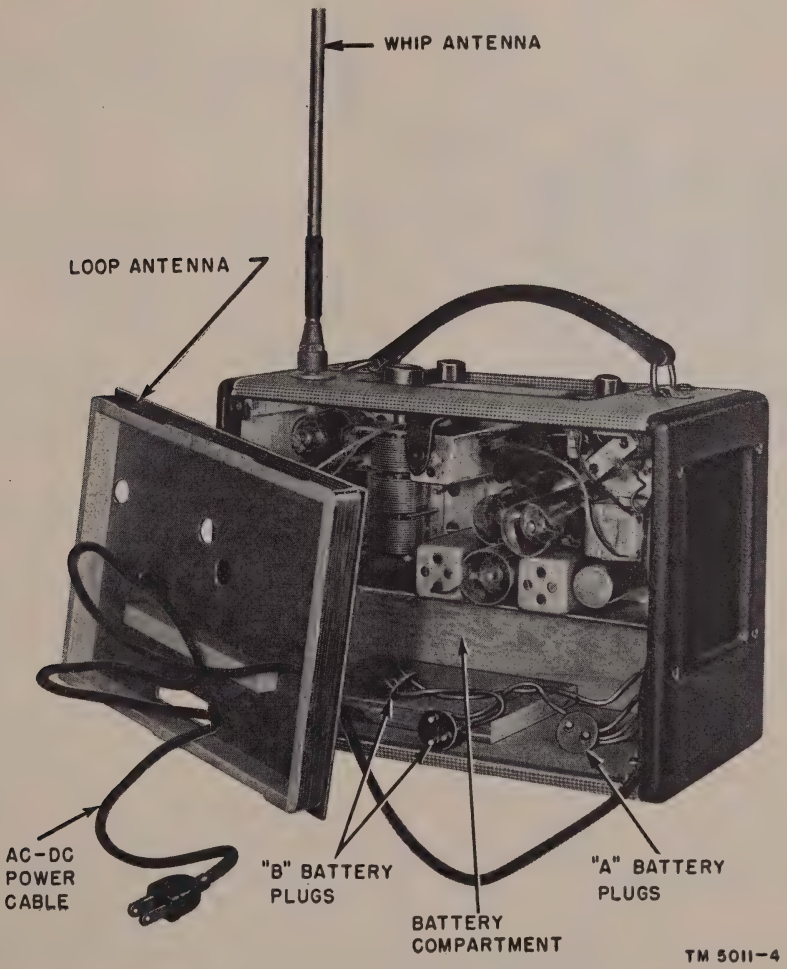


Figure 4. Radio Receiver R-206A/PR, interior view.

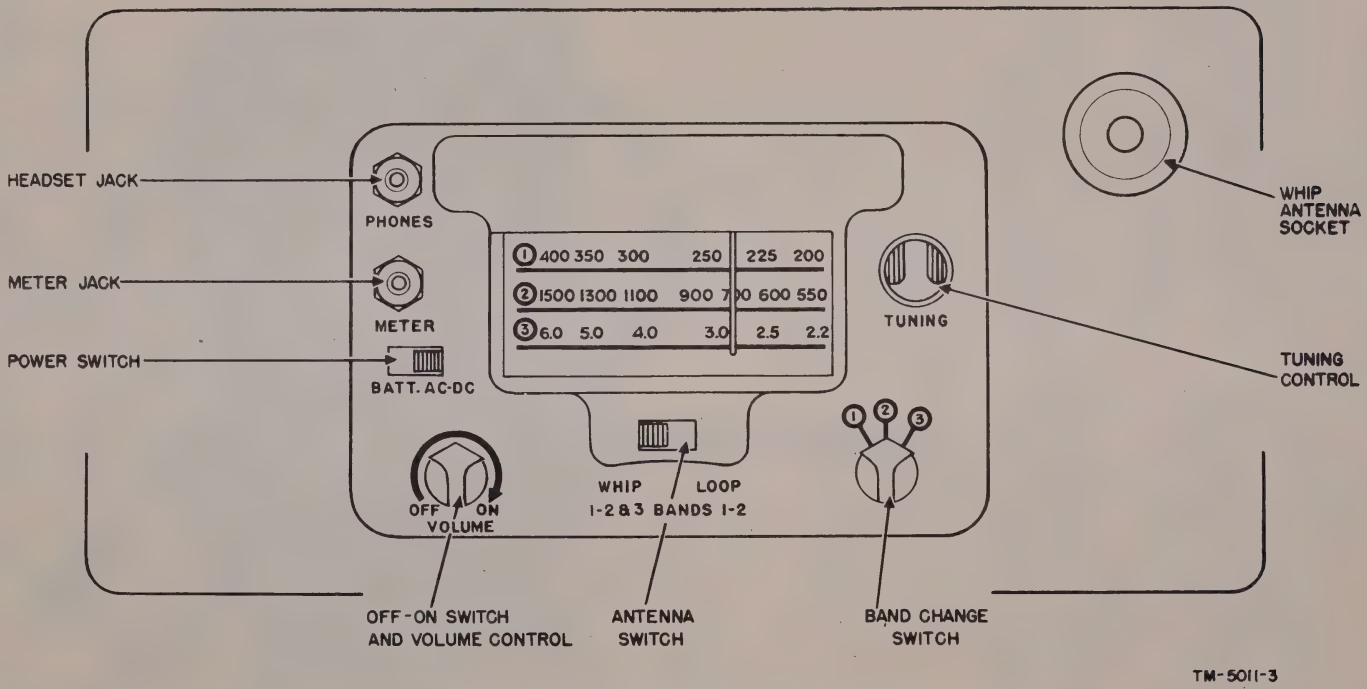


Figure 5. Radio Receiver R-206A/PR, control panel.

Section II. CONTROLS AND INSTRUMENTS

9. Description and Purpose of Controls (fig. 5)

a. BATT. AC-DC SWITCH. The BATT. AC-DC switch, located on the left side of the control panel, selects the source of power from which the receiver is to be operated. For battery operation snap the switch to the left. For either a-c or d-c operation snap the switch to the right.

b. BAND SWITCH. The band switch, located in front right-hand corner of the control panel, selects band 1, 2, or 3 (195 to 410 kc, 540 to 1,560 kc, or 2,200 to 6,200 kc).

c. TUNING CONTROL. The TUNING control, located in the back right-hand corner of the control panel, is used for tuning the receiver to any frequency within the band selected by the band switch.

d. OFF-ON-VOLUME CONTROL. The OFF-ON-VOLUME control, located in the front left-hand corner of the control panel, is used to turn the receiver on and off and to control the gain of the receiver.

e. WHIP-LOOP SWITCH. The WHIP-LOOP switch, located in the front center of the control panel, is used to connect either the whip antenna or the self-contained loop antenna to the receiver input circuit.

f. PHONES JACK. The PHONES jack is lo- in the back left-hand corner of the control panel and may be used for connecting a headset by means of a standard Plug PL-55. When a headset is plugged in, the built-in speaker is automatically disconnected from the circuit.

g. METER JACK. The METER jack is located directly in front of the headset jack and may be used for connecting a signal-strength indicating meter by means of a standard Plug PL-55.

10. Description and Purpose of Whip Antenna

The whip antenna is designed with collapsible sections, thus permitting compact packing. In its extended form it provides adequate pick-up for the desired type of reception. The whip antenna socket is located to the right and toward the back of the control panel.

Section III. OPERATION UNDER USUAL CONDITIONS

11. Starting

a. CONNECTING TO A-C OR D-C POWER SOURCE. If the receiver is to be operated on ac or dc, open the hinged door on back of the cabinet (fig. 6) and pull out the attachment cord. Plug the cord into an outlet for 105- to 125-volt dc or 105- to 125-volt, 50/60-cycle.

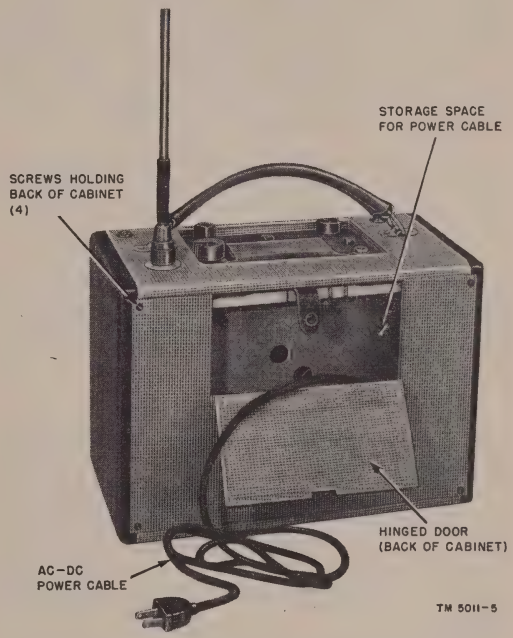


Figure 6. Radio Receiver R-206A/PR, rear view.

b. CONNECTING WHIP ANTENNA. Extend the collapsible whip antenna so that all sections are properly joined. Place the whip in the antenna socket and turn it clockwise until tight.

c. SELECTING POWER SOURCE. If the receiver is to be used on a-c or d-c power, slide the BATT. AC-DC switch to the AC-DC (right-hand) position. If the receiver is to be used on the self-contained battery supply, slide the BATT. AC-DC switch to the BATT. (left-hand) position.

d. APPLYING POWER. Turn the OFF-ON-VOLUME control clockwise until a click is heard.

12. Receiving

a. SELECTING FREQUENCY RANGE. Turn the band switch to position 1, 2, or 3 for operation between 195 and 410 kc, 540 and 1,560 kc. or 2,200 and 6,200 kc, respectively.

b. SELECTING ANTENNA. Slide the antenna switch to the WHIP (left-hand) position for operation with the whip antenna on any of the three bands. Slide the switch to the LOOP (right-hand) position for operation with the loop antenna on band No. 1 or 2.

c. SELECTING EXACT FREQUENCY. Turn the TUNING control until the dial pointer is at the approximate position for the desired station. Turn the volume control clockwise until reception is heard and readjust the TUNING control, if necessary, for clear reception; set the volume control for a comfortable listening level.

Note. If the receiver is being operated on dc and reception is not obtained within 1 minute after turning on the OFF-ON switch, reverse the attachment cord plug in the power outlet.

d. HEADSET RECEPTION. Insert the plug on the headset cord into the PHONES jack located in the back left-hand corner of the control panel. When the headset is connected, reception cannot be heard over the built-in loudspeaker.

e. LOOP ANTENNA DIRECTIONAL EFFECT. If the receiver is being operated with the antenna switch in the LOOP (right-hand) position, a directional effect will be noted on practically all stations being received. For best results when tuned to any particular station, the receiver should be lifted by the carrying handle and turned slowly first in one direction and then the other until the signals are loudest.

f. SIGNAL STRENGTH INDICATION WITH METER. Radio Receiver R-206A/PR may be used for measuring field intensities by plugging an indicating meter into the METER jack located directly in front of the PHONES jack. The meter should be a rectifier type a-c voltmeter with a 0- to 5-volt range.

13. Stopping

a. OFF-ON SWITCH. Turn the OFF-ON-VOLUME control counterclockwise until a click indicates that the power switch is turned off.

b. DISCONNECTING WHIP ANTENNA. Disconnect the whip antenna by turning it counterclockwise in the socket. After it has been disconnected, collapse it by successively disjoining each section; begin at the tip section.

c. DISCONNECTING FROM A-C OR D-C POWER. Unplug the attachment cord from the power outlet and push the cord back into the cabinet. Close the hinged door.

14. Equipment Perfomance Checklist

a. PURPOSE AND USE. (1) *General.* The equipment performance checklist will help the operator to determine whether Radio Receiver R-206-A/PR is functioning properly. The checklist gives the items to be checked, the conditions under which the item is checked, the normal indications of correct operation, and the corrective measures that the operator can take. Items 1 through 6 are to be checked before starting, item 7 when starting, items 8 through 10 during operation, and item 11 when stopping. Items 8 through 10 should be checked at least once during a normal operating period, or at least four times a day during continuous operation.

(2) *Action or condition.* For some items the information given in the *Action or condition* colume consists of various switch and control settings under which the item is to be checked. For other items it represents an action that must be taken in order to check the normal indication given in the *Normal indications* column.

(3) *Normal indications.* The normal indications listed include the visible and audible signs that the operator should perceive when he checks the items. If the indications are not normal, the operator should apply the recommended corrective measures.

(4) *Corrective measures.* The corrective measures listed are those that the operator can make without turning in the equipment for repairs. If the set is completely inoperative, or if the recommended corrective measures do not yield results, trouble shooting is necessary. However, if the tactical situation requires that communication be maintained, and if the set is not completely inoperative, the operator must maintain the set in operation as long as it is possible to do so.

(5) *Items 1 through 7.* Items 1 through 7 should be checked each time the equipment is put into operation.

(6) *Items 8 through 10.* Items 8 through 10 represent general operating characteristics of the receiver. The operator must become familiar with

the characteristics of the set during normal operation, and he must use that knowledge as a basis for recognizing changes in audible or visual indications when the set is not operating properly. For example, by becoming familiar with the operation of the receiver, the operator will know the normal position of the volume control. If it becomes necessary to advance the control beyond the normal setting, loss of sensitivity and amplification will be apparent.

(7) *Item 11.* Item 11 should be checked whenever the receiver is taken out of operation. Any abnormal indications at this time are probably caused by trouble in the set and should be corrected before the next expected period of operation.

b. CHECKLIST.

	Item No.	Item	Action or Condition	Normal indications	Corrective measures
PREPARATORY	1	Whip antenna (if used).	Place in extended position and attach to socket.		
	2	Headset (if used).	Headset plugged into PHONES jack.		
	3	WHIP-LOOP switch.	Slide to correct position (WHIP or LOOP).		
	4	BATT. AC-DC switch.	Slide to correct position (AC-DC or BATT.).		
	5	Band switch.	Set to correct band (1, 2, or 3).		
	6	TUNING control.	Set to approximate frequency desired.		
START	7	OFF-ON switch.	Turn to ON position.		
EQUIPMENT PERFORMANCE	8	VOLUME control.	Rotate in a clockwise direction.	Increased output will be heard in the headset or loudspeaker.	If receiver is operated on batteries, check battery plugs and connections. Check position of antenna switch. Check position of power switch. If receiver is operated on dc, and no sound is heard, reverse power plug.
	9	Headset or loudspeaker.	Set operating normally. Headset plug inserted completely.	Signal is heard. *Note.* When headset is plugged in, speaker is cut out.	Check plug and cable connections.
	10	VOLUME control.	Turn to extreme counterclockwise position.	No output.	
STOP	11	OFF-ON switch.	Turn to OFF position.		

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

15. Arctic Operation

When Radio Receiver R-206A/PR is operated on dry-cell batteries at low temperatures, it should, if possible, be allowed to stand with power off in a heated shelter prior to operation. For additional precautions, refer to paragraph 36 of TB SIG 66, Winter Maintenance of Signal Equipment.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION

16. Lubrication

For preservative purposes, apply a thin film of Special Preservative Lubricating Oil (PL-SPECIAL), U. S. Army Spec 2-120, to all external metallic surfaces. Lubrication of internal parts of Radio Receiver R-206A/PR is not required, and the use of lubricants may prove harmful to the proper functioning of the equipment.

Section II. PREVENTIVE MAINTENANCE SERVICES

17. General

The following checklist is a summary of the preventive maintenance operations to be performed on Radio Receiver R-206A/PR. The time intervals shown on the checklist may be reduced at any time by the local commander. For best performance of the equipment, perform operations at least as frequently as called for in the checklist.

18. Preventive Maintenance Checklist

Item No.	Operations	Item	When performed			
			Before operation	After operation	Daily	Weekly
1	Clean	Exterior of receiver			X	
2	Inspect	Battery plug-in connections (fig. 4). Be sure plugs are seated firmly.	X		X	
3	Test	Battery voltages. Replace weak batteries (par. 7b)	X	X		
4	Tighten	Whip antenna connection	X			
5	Clean	Headset and cable plug	X			X
6	Inspect	Control knobs (fig. 5). Tighten loose knobs. Be sure band switch knob is in correct position	X			X
7	Inspect	Tubes. All tubes must be seated firmly in sockets, and all grid-cap connections must be in position (fig. 7)	X			X
8	Inspect	Loop antenna connections (fig. 4). Tighten any loose connections on terminal board	X			X
9	Clean	Indicating meter and plug (not supplied)	X			X
10	Inspect	Whip antenna. Check for proper joining of all sections	X			X
11	Inspect	A-c-d-c power cable. Check for worn insulation or exposed wires in cable	X			X
12	Test	Dial pointer. Check for correct movement when turning TUNING knob	X			X

CHAPTER 4

TECHNICAL SERVICE AND MAINTENANCE INSTRUCTIONS

Section I. ALINEMENT PROCEDURE

19. Precautions

Radio Receiver R-206A/PR has been completely alined prior to shipment. In the event of abnormal operation, all possible sources of trouble should be checked (par. 27) before changing the initial alinement of the receiver. Only qualified repair personnel should attempt realinement.

20. Test Equipment Required

The test equipment required for alining Radio Receiver R-206A/PR is listed in subparagraphs a through e below.

a. SIGNAL GENERATOR. The signal generator must provide accurately calibrated signals over the entire range of the receiver (195 to 6,200 kc). Signal Generator I-72-( ) is satisfactory.

b. OUTPUT METER. The output meter should be a rectifier type a-c voltmeter with a 0- to 5-volt scale. Test Set I-56-( ) is satisfactory.

c. ALINEMENT TOOL. A nonmetallic screwdriver is required for alining the receiver.

d. DUMMY ANTENNAS AND ISOLATION CAPACITOR. A 0.1-mf (microfarad) capacitor and a 20-mmf capacitor are required for use as dummy antennas during the alinement procedure. A 0.1-mf capacitor is also required for use in the ground lead between the signal generator and the receiver chassis.

e. FREQUENCY METER. If a frequency meter is available, it should be used for testing the accuracy of the signal generator at its various settings during alinement (par. 21). Frequency Meter Set SCR-211-( ) is adequate.

21. Calibration of Signal Generator

If a frequency meter is available, the signal generator should be checked for accuracy at each of the test signals used. To make the checks, perform the steps in subparagraphs a through f below.

a. Place the signal generator and the frequency meter near each other. Turn on both equipments and allow them to warm up for at least 15 minutes.

b. Attach a piece of wire to the output connection of the signal generator and place the wire near the antenna of the frequency meter.

c. Calibrate the frequency meter according to the instructions furnished with the meter.

d. Set the frequency meter to the exact frequency at which the signal generator is to be used.

e. While listening with the headset connected to the frequency meter, tune the signal generator about the approximate frequency until a zero beat is obtained. The signal generator will then be set for the exact frequency.

f. Turn off the frequency meter and remove the wire attached to the output connection of the signal generator.

22. Preliminary Steps

a. With the exception of antenna trimmer capacitors C-2A, C-2B, and C-2C, all alinement controls are accessible through the rear of the receiver. To gain access to these controls, remove the four screws which hold the back of the cabinet in place, remove the back, and swing the loop antenna to one side (fig. 4). Access to antenna trimmers C-2A, C-2B, and C-2C may be obtained by removing the nameplate on the front of the receiver (fig. 2). The location of all alinement controls is indicated in figure 7.

b. With the TUNING control in the maximum counterclockwise position (tuning capacitor fully open), adjust the dial pointer so that it is in line with the encircled numeral 1 on band 1.

c. Plug the output meter into the METER jack on the receiver panel. Adjust the meter controls for a-c measurements on the 0- to 5-volt scale.

d. Connect the ground terminal of the signal generator to the chassis of the receiver through a 0.1-mf capacitor.

e. Plug the line cord of the receiver into an outlet for 105 to 125 volts ac or dc. Place the BATT. AC-DC switch in the AC-DC position, and turn the OFF-ON-VOLUME control to its maximum clockwise position. Leave the control at maximum for all the tuning adjustments.

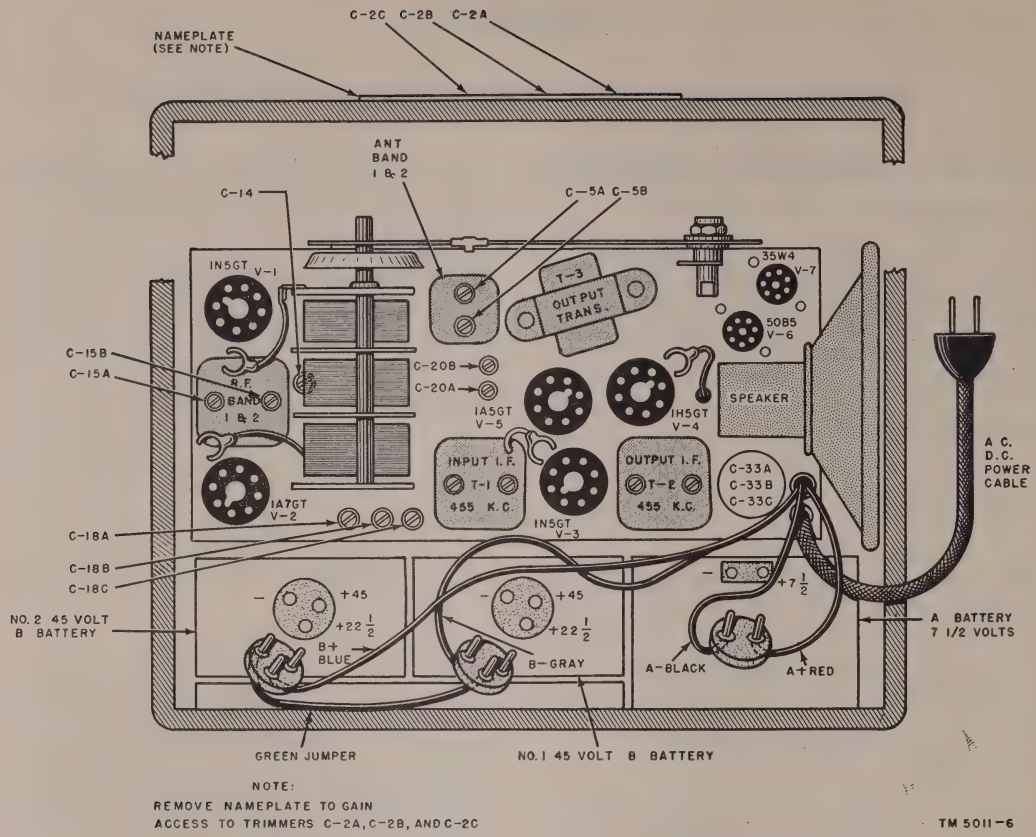


Figure 7. Radio Receiver R260A/PR, component layout.

f. Turn on the signal generator. Allow the receiver and signal generator to warm up for several minutes.

23. I-f Alinement Procedure

a. Connect the output of the signal generator to the grid cap of i-f stage V-3 (fig. 7) through a 0.1-mf capacitor. Adjust the generator to supply a 455-kc signal.

b. With the TUNING control set approximately in the center of its range (dial pointer at 1000 on band 2) adjust the two trimmers on output i-f transformer T-2 and the two trimmers on input i-f transformer T-1 (fig. 7) for maximum indications on the output meter. Keep the meter reading near midscale by reducing the signal generator output, if necessary, during the tuning procedure. Repeat the adjustments on T-2 and T-1 several times to insure peak tuning.

c. Disconnect the signal generator output from the grid of i-f stage V-3.

24. Band 1 Alinement

a. With the WHIP-LOOP switch in the WHIP position and the band switch in the No. 1 position, connect the signal generator output to the whip antenna socket through a 20-mmf (micromicrofarad) capacitor.

b. Adjust the signal generator to provide a 400-kc signal and turn the TUNING control of the receiver until the dial pointer is at 400 on band 1.

c. Adjust, in the order indicated, oscillator trimmer C-18C, r-f trimmer C-15B, and antenna trimmer C-5B (fig. 7) for maximum indications on the output meter.

d. Set the signal generator for 220 kc, and turn the receiver TUNING control until the dial pointer is at 220 on band 1.

e. Adjust oscillator padder C-20B (fig. 7) and simultaneously rock the TUNING control to obtain a maximum indication on the output meter.

f. Return the signal generator controls and the receiver TUNING control to the 400-kc settings, and readjust oscillator trimmer C-18C, r-f trimmer C-15B, and antenna trimmer C-5B for maximum output.

g. Repeat steps d, e, and f above.

h. Place the WHIP-LOOP switch in the LOOP position and place the loop in its operating position. Connect approximately 6 inches of wire in series with the lead from the generator, and place the wire approximately 1 inch from the loop.

i. With the generator and the receiver set at 400 kc, adjust antenna trimmer C-2A (fig. 7) for maximum reading on the output meter.

25. Band 2 Alinement

a. Place the WHIP-LOOP switch in the WHIP position and the band switch in the No. 2 position. Connect the signal generator to the whip antenna socket through the 20-mmf capacitor.

b. Adjust the signal generator to provide a 1,400-kc signal and turn the TUNING control of the receiver until the dial pointer is at 1400 on band 2.

c. Adjust, in the order indicated, oscillator trimmer C-18B, r-f trimmer C-15A, and antenna trimmer C-5A (fig. 7) for maximum indications on the output meter.

d. Set the signal generator for 600 kc and turn the receiver TUNING control until the dial pointer is at 600 on band 2.

e. Adjust oscillator padder C-20A (fig. 7) and simultaneously rock the TUNING control to obtain a maximum indication on the output meter.

f. Return the signal generator controls and the receiver TUNING control to the 1,400-kc settings, and readjust oscillator trimmer C-18B, r-f trimmer C-15A, and antenna trimmer C-5A for maximum output.

g. Repeat steps d, e, and f above.

h. Place the WHIP-LOOP switch in the LOOP position and couple the signal generator to the loop as in subparagraph h of paragraph 24.

i. With the generator and the receiver set at 1,400 kc, adjust antenna trimmer C-2B (fig. 7) for maximum reading on the output meter.

26. Band 3 Alinement

a. Place the WHIP-LOOP switch in the WHIP position and the band switch in the No. 3 position. Connect the signal generator to the whip antenna socket through the 20-mmf capacitor.

b. Adjust the signal generator to provide a 6-mc signal and turn the TUNING control of the receiver until the dial pointer is at 6.0 on band 3.

c. Adjust oscillator trimmer C-18A (fig. 7) for maximum indication on the output meter.

d. Adjust, in the order indicated, r-f trimmer C-14 and antenna trimmer C-2C. Rock the TUNING control while making these adjustments.

Section II. TROUBLE SHOOTING

27. Trouble-shooting Procedures

a. TROUBLE-SHOOTING STEPS. The first step in servicing a defective radio set is to *sectionalize* the fault. Sectionalization means tracing the fault to the *component* or *circuit* responsible for the abnormal operation of the set. The second step is to *localize* the fault. Localization means tracing the fault to the defective *part* responsible for the abnormal condition. Some faulty components, such as burned-out resistors, burned-out capacitors, and shorted transformers, can be located by sight, smell, and hearing. The majority of faults, however, must be located by checking voltage and resistance. The accompanying trouble-shooting chart, if properly used, simplifies trouble shooting. The chart lists various symptoms which may be recognized easily by the operator and gives the probable location of the existing trouble and the recommended correction. Tube socket voltage and resistance measurements are shown in figure 8. A schematic diagram of the receiver is shown in figure 9.

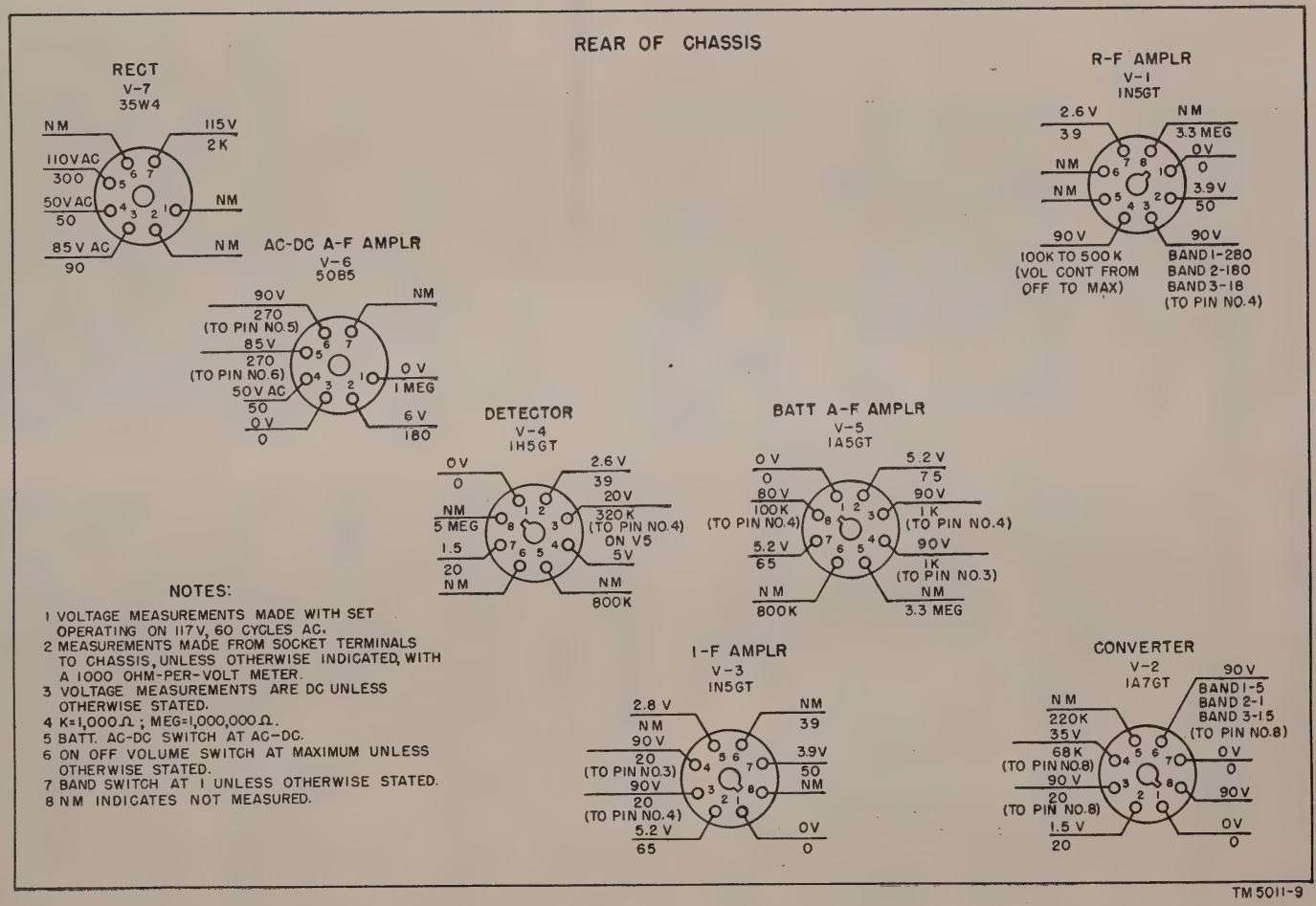


Figure 8. Tube socket voltage and resistance diagram.

b. TROUBLE-SHOOTING CHART.

Symptom	Probable trouble	Correction
1. Radio Receiver R-206A/PR completely inoperative.		
a. BATT. operation.	(1) Worn-out batteries.	(1) Replace.
	(2) Battery plugs not connected.	(2) Connect.
	(3) Broken battery plugs or wire.	(3) Repair or replace.
	(4) Defective BATT. AC-DC switch.	(4) Replace.
	(5) Defective tubes.	(5) Replace.
	(6) Open connection in headset or in its connections to receiver.	(6) Replace defective headset or repair open circuit.
	(7) Tube out of socket.	(7) Insert tube.
	(8) Defective audio transformer T-3.	(8) Replace.
b. AC-DC operation.	(1) Defective BATT. AC-DC switch.	(1) Replace.
	(2) Defective power cable or plug.	(2) Replace.
	(3) Defective tubes.	(3) Replace.
	(4) Open connection in headset or in its connections to receiver.	(4) Replace defective headset or repair open circuit.
	(5) Tube out of socket.	(5) Insert tube.
	(6) Defective audio transformer T-3.	(6) Replace.
	(7) Reversed polarity (d-c operation only.)	(7) Reverse power plug.
2. Receiver inoperative on band 3 only.	*a.* Antenna switch in LOOP position.	*a.* Switch to WHIP position.
	b. Whip antenna not connected.	*b.* Connect.
	c. Defective band switch.	*c.* Replace.
	d. Defective coils on band 3.	*d.* Replace.
3. Receiver inoperative on band 1 or 2 only.	*a.* Defective band switch.	*a.* Replace.
	b. Defective coils on band 1 or 2.	*b.* Replace.
	c. Broken loop antenna leads.	*c.* Repair.
4. Weak reception.		
a. BATT. operation.	(1) Weak batteries.	(1) Replace.
	(2) Defective tubes.	(2) Replace.
	(3) Broken loop antenna leads.	(3) Repair.
	(4) Whip antenna not connected.	(4) Connect.
	(5) Incorrect alignment.	(5) Realine.
b. AC-DC operation.	(1) Defective tubes.	(1) Replace.
	(2) Broken loop antenna leads.	(2) Repair.
	(3) Whip antenna not connected.	(3) Connect.
	(4) Incorrect alinement.	(4) Realine.

Section III. PRESERVATIVE TREATMENT

28. Weatherproofing

a. TROPICAL OPERATION. Radio Receiver R-206-A/PR is protected against deterioration under tropical climatic conditions by a moistureproofing and fungiproofing varnish treatment applied at the time of manufacture. For re-treatment by field or base maintenance personnel, refer to TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment.

b. DESERT OPERATION. To prevent failure of Radio Receiver R-206A/PR because of infiltration of dust or dirt, take the precautions outlined in TB SIG 75, Desert Maintenance of Ground Signal Equipment.

c. ARCTIC OPERATION. Radio Receiver R-206-A/PR will perform satisfactorily under low-temperature conditions. Note the precautions listed in paragraph 15.

APPENDIX I

SHIPMENT AND STORAGE

Note. If Radio Receiver R-206A/PR must be repacked for shipment or for limited storage within the scope of the using arms and services in the zone of the interior, the batteries should be disconnected and removed from the receiver. The packaging procedure is the reverse of the unpacking procedure shown on figure 3.

APPENDIX II

REFERENCES

Note. For availability of items listed, check FM 21-6 and Department of the Army Supply Catalog SIG 1. Also see latest issue of FM 21-6 for applicable technical bulletins, supply bulletins, modification work orders, and Changes.

1. Army Regulations

AR 380-5 Safeguarding Military Information.

2. Supply Publications

SIG 1 Introduction and Index.
SIG 5 Stock List of All Items.
SIG 7 & 8 Organizational and Higher Echelon Spare Parts.
SB 11-6 Dry Battery Supply Data.
SB 11-17 Electron Tube Supply and Reference Data.
SB 11-76 Signal Corps Kit and Materials for Moisture- and Fungi-Resistant Treatment.

3. Technical Manuals on Auxiliary Equipment and Test Equipment

TM 11-300 Frequency Meter Sets SCR-211-(*).
TM 11-303 Test Sets I-56-C, -D, -H, and -J.
TM 11-307 Signal Generators I-72-G,-H,-J, and -K.
TM 11-321 Test Set I-56-E.
TM 11-2613 Voltohmmeter I-166.
TM 11-2626 Test Unit I-176.
TM 11-2627 Tube Tester I-177.

4. Painting, Preserving, and Lubrication

TB SIG 13 Moistureproofing and Fungiproofing Signal Corps Equipment.

5. Demolition

FM 5-25 Explosives and Demolitions.

6. Packaging and Packing Instructions

a. JOINT ARMY-NAVY PACKAGING SPECIFICATIONS.
JAN-D-169 Desiccants, Activated.
JAN-P-100 General Specifications.
JAN-P-106 Boxes, Wood, Nailed.
JAN-P-116 Preservation, Methods of.
JAN-P-125 Barrier Material, Waterproof.
JAN-P-131 Barrier Material, Moisture-Vaporproof, Flexible.

b. U. S. ARMY SPECIFICATIONS.
100-2E Marking Shipments by Contractors (and Signal Corps Supplement thereto).

c. SIGNAL CORPS INSTRUCTIONS.
720-7 Standard Pack.
726-15 Interior Marking.

7. Other Publications

FM 21-6 List and Index of Department of the Army Publications.
FM 24-18 Radio Communication.
TB SIG 25 Preventive Maintenance of Power Cords.
TB SIG 66 Winter Maintenance of Signal Equipment.
TB SIG 72 Tropical Maintenance of Ground Signal Equipment.
TB SIG 75 Desert Maintenance of Ground Signal Equipment.
TB SIG 123 Preventive Maintenance Practices for Ground Signal Equipment.
TM 1-455 Electrical Fundamentals.
TM 11-314 Antennas and Antenna Systems.
TM 11-455 Radio Fundamentals

8. Forms

WD AGO Form 468 (Unsatisfactory Equipment Report.)
AAF Form 54 (Unsatisfactory Report).

9. Abbreviations

a-c alternating-current
a-f audio-frequency
a-m amplitude-modulated
d-c direct-current
i-f intermediate-frequency
kc kilocycles
mf microfarad
mmf micromicrofarad
mw milliwatt
r-f radio-frequency

10. Glossary

Refer to the glossary in TM 11-455.

APPENDIX III

IDENTIFICATION TABLE OF PARTS

Note. The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as T/O&E, TE, TA, T/BA, SIG 10, list of allowances of expendable material, or another authorized supply basis. Pamphlets of the Department of the Army Supply Catalog applicable to the equipment covered in this instruction book are listed in paragraph 1 below.

1. Supply Catalog Pamphlet Reference

The following information was compiled on 13 January 1949. The appropriate pamphlet of the Department of the Army Supply Catalog for Radio Receiver R-206A/PR is:

Fixed Plant Maintenance Lists

SIG 10 R-206/PR (when published)

For an index of available catalog pamphlets, see the latest issue of Department of the Army Supply Catalog SIG 1.

2. Identification Table of Parts for Radio Receiver R-206A/PR

Ref symbol	Name of part and description	Function of part
E-1	ANTENNA: loop type; for receiving; Lear part/dwg ✱53711.	Loop antenna.
E-2	ANTENNA: whip; for receiving; Lear part/dwg. ✱50233.	Whip antenna.
E-3	BOARD, terminal: general purpose; 2 brass tin-pl solder lug term; Cinch ✱1520.	Terminal board.
E-4	BOARD, terminal: general purpose; 5 brass tin-pl solder lug term; Faber ✱T-5-7.	Terminal board.
	CABINET: for receiver unit; 12″ lg x 6½″ wd x 11⅜″ h overall; Lear part/dwg ✱53705.	Receiver housing.
W-1	CABLE ASSEMBLY, power: 3 cond, 2 ✱18 AWG stranded and 1 built-in resistance wire, 215 ohms, ± 5% at 0.15 amp; approx 5 ft lg excl term; brown cotton braid covering; std flat molder rubber AC plug at one end, tinned leads at other end; connecting leads color-coded; Lear part/dwg ✱54935.	A-C — d-c line cord.
C-10	CAPACITOR, fixed: ceramic; 3.0 mmf ±1 mmf; 500 vdcw; JAN type CC21AJ030F.	R-f coupling, coil L-5.
C-3	CAPACITOR, fixed: ceramic; 6 mmf ± 1 mmf; 500 vdcw; JAN type CC21AH060F.	R-f coupling, coil L-2.
C-4, C-11	CAPACITOR, fixed: ceramic; 10 mmf ± 1 mmf; 500 vdcw; JAN type CC21AH100F.	C-4: R-f coupling, coil L-2 C-11: R-f coupling, coil L-5.
C-17	CAPACITOR, fixed: ceramic; 20 mmf ± 10%; 500 vdcw; JAN type CC21UK200K.	Oscillator tuning, band 3.
C-35	CAPACITOR, fixed: electrolytic; 20mf −10% + 150%; 25 vdcw; Lear part/dwg ✱60003.	Cathode bypass, V-6.
C-34	CAPACITOR, fixed: electrolytic; 200 mf −10% +150%; 10 vdcw; Lear part/dwg ✱54057.	Surge protection, V-5 filament.
C-33A, B, C	CAPACITOR, fixed: electrolytic; 3 sect; 50-30-200 mf +150% −10%; 2 sect 150 vdcw, 1 sect 6 vdcw; Sprague type FP; Lear part/dwg ✱53728.	C-33A: Filament filter. C-33B: B+ filter. C-33C: B+ filter.
C-12, C-16, C-23, C-25	CAPACITOR, fixed: mica; 100 mmf ±10%; 500 vdcw; JAN type CM20B101K.	C-12: V-1 plate tuning, band 1. C-16: Oscillator grid coupling, V-2. C-23: R-f bypass, V-4. C-24: R-f bypass, V-4.
C-7	CAPACITOR, fixed: mica; 220 mmf ±10%; 500 vdcw; JAN type CM20B221K.	R-f coupling, V1.
C-1	CAPACITOR, fixed: mica; 1000 mmf ±10%; 500 vdcw; JAN type CM25B102K.	R-f coupling, whip antenna.
C-19	CAPACITOR, fixed: mica; 1600 mmf ±5%; 500 vdcw; JAN type CM30B162J.	Oscillator padding, band 3.
C-24, C-30	CAPACITOR, fixed: paper dielectric; 2000 mmf −20% +40%; 400 vdcw; Lear part/dwg ✱56614.	C-24: Audio coupling, V-4 C-30: Audio bypass, T-3.
C-29	CAPACITOR, fixed: paper dielectric; 5000 mmf ±20% vdcw; JAN type CP26A1DF602M.	Audio bypass, T-3.
C-26, C-27	CAPACITOR, fixed: paper dielectric; 10,000 mmf ±20%; 600 vdcw; JAN type CP26A1DF103M.	C-26: Audio coupling, V-6 C-27: Audio coupling, V-5.
C-13, C-22, C-36	CAPACITOR, fixed: paper dielectric; 50,000 mmf ±20%; 600 vdcw; JAN type CP26A1DF503M.	C-13: B+ decoupling C-22: Filament r-f bypass C-36: A-c line r-f bypass.
C-21, C-28, C-31, C-32	CAPACITOR, fixed: paper dielectric; 100,000 mmf ±10%; 200 vdcw; JAN type CP26A1DC104K.	C-21: Screen r-f bypass, V-2 C-28: Audio decoupling, V-4 C-31: Filament r-f bypass C-32: Filament r-f bypass.
C-8A, B, C	CAPACITOR, variable: air dielectric; plate meshing type 3 sect; capacity ea sect 0 to 420 mmf; Lear part/dwg ✱54070.	C-8A: R-f tuning, V-1 C-8B: R-f tuning, V-2 C-8C: Oscillator tuning, V-2.

2. Identification Table of Parts for Radio Receiver R-206A/PR (contd)

Ref symbol	Name of part and description	Function of part
C-14	CAPACITOR, variable: mica; capacity 3 to 37 mmf; Lear part/dwg #56748.	R-f trimming, band 3.
C-5A, B, C-15A, B	CAPACITOR, variable: mica; 2 sect; capacity first sect 7 to 35 mmf, capacity second sect 25 to 160 mmf; Lear part/dwg #53795.	C-5A: Whip antenna, trimming, band 2 C-5B: Whip antenna, trimming, band 1 C-15A: R-f trimming, band 2 C-15B: R-f trimming, band 1.
C-20A, B	CAPACITOR, variable: mica; 2 sect; capacity 1 sect 50 to 230 mmf, capacity other sect 200 to 560 mmf; Lear part/dwg #53713.	C-20A: Oscillator padding, band 2. C-20B: Oscillator padding, band 1.
C-2A, B, C	CAPACITOR, variable: mica; three sect; capacity 1 sect 10 to 160 mmf, capacity other 2 sect 2.5 to 30 mmf; Teleradio Eng #18-F-84 PT-5.	C-2A: Loop antenna trimming, band 1 C-2B: Loop antenna trimming, band 2 C-2C: Whip antenna trimming, band 3.
C-18A, B, C	CAPACITOR, variable; mica; 3 sect; capacity 1 sect 10 to 160 mmf, capacity other 2 sect 2.5 to 30 mmf; Teleradio Eng. #MT-43C.	C-18A: Oscillator trimming, band 3 C-18B: Oscillator trimming, band 2 C-18C: Oscillator trimming, band 1.
L-3	COIL, RF: antenna; bakelite form, air core; Lear part/dwg #62927.	Whip antenna tuning, band 3.
L-2	COIL, RF: antenna; bakelite form, air core; Lear part/dwg #62928.	Whip antenna tuning, bands 1 and 2.
L-1	COIL, RF: antenna shunt; molded bakelite form, air core; Lear part/dwg #62952.	Loop shunt, band 2.
L-6	COIL, RF: oscillator; bakelite form, air core; Lear part/dwg #50236.	Oscillator tuning, band 3.
L-7	COIL, RF: oscillator; bakelite form, air core; Lear part/dwg #53739.	Oscillator tuning, bands 1 and 2.
L-4	COIL, RF: RF transformer; bakelite form, air core; Lear part/dwg #50160.	R-f tuning, band 3.
L-5	COIL, RF: RF transformer; bakelite form, air core; Lear part/dwg #53740.	R-f tuning, bands 1 and 2.
J-1, J-2	JACK, telephone: for 2 cond 0.25″ diam plug; Utah type 1J-102-2A IMP short jack.	J-1: Meter jack J-2: Phone jack.
H-5	NUT, hexagon: brass; No. ½″-20; Lear part/dwg #50323.	Whip antenna socket fastener.
A-1	PLATE, cover: for dial; Lear part/dwg #62929.	Protective cover.
H-6	POINTER, indicator: for dial; Lear part/dwg #53714.	Indicator.
R-20	RESISTOR, fixed: composition; 27 ohms ±10%; 1 w; JAN type RC30BF270K.	Current limiting, V-7.
R-19	RESISTOR, fixed: composition; 180 ohms ±10%; ½ w; JAN type RC20BF181K.	Cathode bias, V-6.
R-18	RESISTOR, fixed: composition; 470 ohms ±10%; 2 w; 1.78″ lg x 0.405″ diam; ins; JAN type RC41BF471K.	B+ filter.
R-15	RESISTOR, fixed: composition; 1,200 ohms ±10%; ½ w; JAN type RC20BF122K.	Filament shunting.
R-4	RESISTOR, fixed: composition; 10,000 ohms ±20%; JAN type RC20BF103K.	Oscillator coil shunt, band 3.
R-8	RESISTOR, fixed: composition; 47,000 ohms ± 20%; ½ w; JAN type RC20BF473K.	R-f filter, V-4.

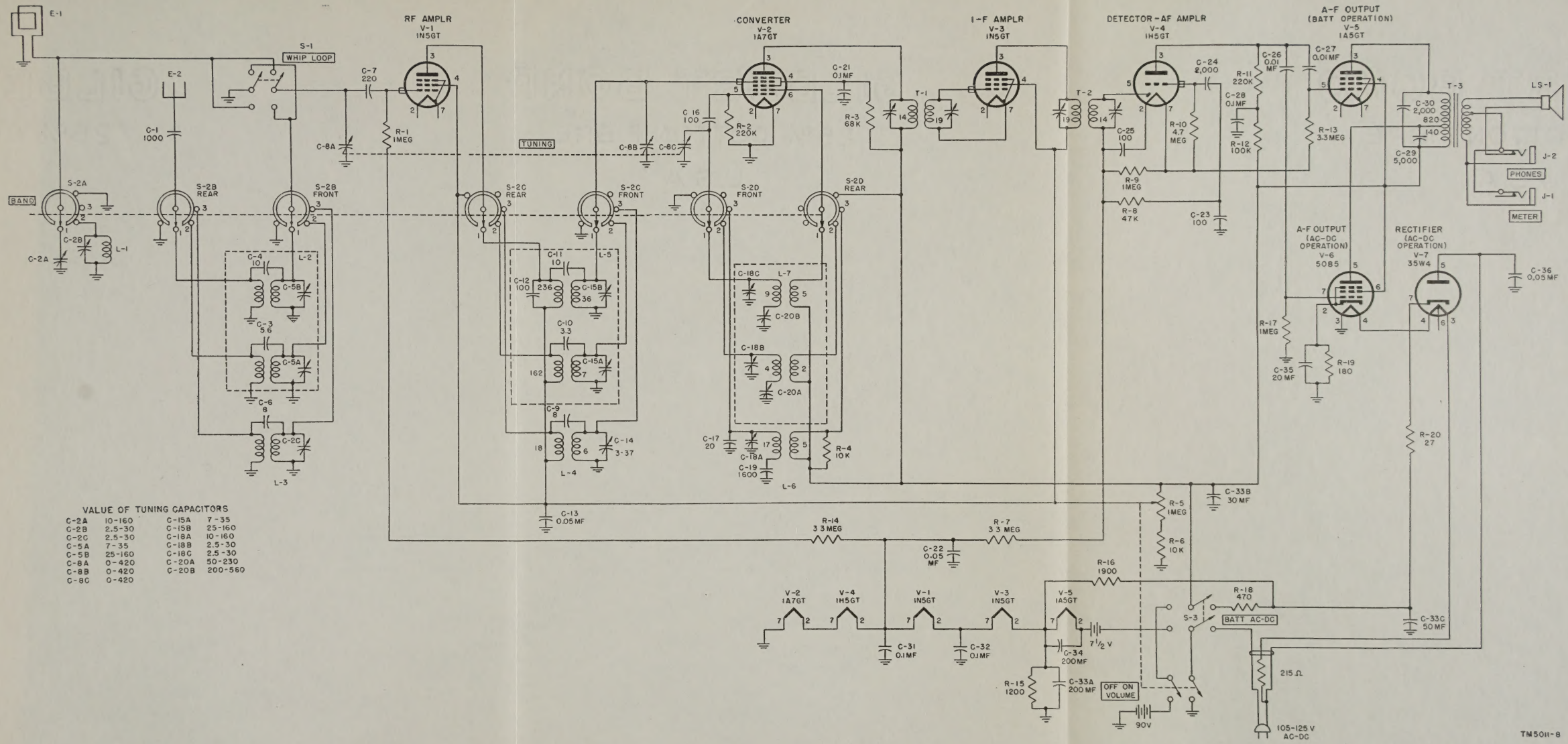
2. Identification Table of Parts for Radio Receiver R-206A/PR (contd)

Ref symbol	Name of part and description	Function of part
R-3	RESISTOR, fixed: composition; 68,000 ohms ±20%; ½ w; JAN type RC20BF683K.	Screen voltage-dropping, V-2.
R-6, R-12	RESISTOR, fixed: composition; 100,000 ohms ±20%; ½ w; JAN type RC20BF104K.	R-6: B+ voltage divider R-12: Plate decoupling, V-4.
R-2, R-11	RESISTOR, fixed: composition; 220,000 ohms ±20%; ½ w; JAN type RC20BF224K.	R-2: Oscillator grid bias, V-2 R-11: Plate load, V-4.
R-1, R-9, R-17	RESISTOR, fixed: composition; 1 megohm ±20%; ½ w; JAN type RC20BF105K.	R-1: Grid return, V-1 R-9: Diode load, V-4 R-17: Grid return, V-6.
R-7, R-13, R-14	RESISTOR, fixed: composition; 3.3 megohms ±20%; ½ w; JAN type RC20BF335K.	R-7: Diode bias, V-4 R-13: Grid return, V-5 R-14: Grid return, V-1.
R-10	RESISTOR, fixed: composition; 4.7 megohms ±20%; ½ w; JAN type RC20BF475K.	Grid return, V-4.
R-16	RESISTOR, fixed: wire wound; 1900 ohms ±10%; 10 w; Utah *10VWQ(CC).	Filament voltage—dropping.
R-5	RESISTOR, variable: composition; 1 megohm ±20%; ½ w; DPST switch; 3 amp 125 V; CTS *WR-35.	Sensitivity (volume) control.
E-5, E-6, E-7	SHIELD, tube: Erie Can *104 x 212.	Tube Shields for tubes V-2, V-3, and V-4.
	MOUNTING, Antenna: brass; Lear part/dwg *50234.	
X-1 thru X-5	SOCKET, tube: octal; Cinch *9900.	Tube sockets for tubes V-1 thru V-5, respectively.
X-6, X-7	SOCKET, tube: 7 cont miniature; JAN type *S011M.	Tube sockets for V-6 and V-7, respectively.
LS-1	SPEAKER, dynamic: 5" diam cone; PM field; Lear part/dwg *53727.	Speaker.
C-2	SPRING: helical extension type; for dial string tension; Lear part/dwg *53715.	Dial-spring tension.
S-2A, B, C, D	SWITCH, rotary: 7 pole, 3 position; Lear part/dwg *62926.	Band selector.
S-1, S-3	SWITCH, slide: DPDT; Lear part/dwg *50230.	S-1: WHIP-LOOP antenna selector S-3: A-c to battery change.
T-3	TRANSFORMER, AF: plate coupling type; Lear part/dwg *53733.	Output load and coupling, V-5, V-6
T-1	TRANSFORMER, IF: 455 kc; input; Lear part/dwg *53730.	Converter—i-f coupling, V-2, V-3.
T-2	TRANSFORMER, IF: 455 kc; output; Lear part/dwg *53729.	I-f—detector coupling, V-3, V-4.
V-5	TUBE, electron: JAN 1A5GT.	A-f output (battery operation).
V-2	TUBE, electron; Jan 1A7GT.	Converter.
V-4	TUBE, electron: JAN 1H5GT.	Detector—a-f amplifier.
V-1, V-3	TUBE, electron: JAN 1N5GT.	V-1: R-f amplifier V-3: I-f amplifier.
V-7	TUBE, electron: JAN 35W4.	Rectifier (a-c—d-c operation).
V-6	TUBE, electron: JAN 50B5.	(A-f output a-c—d-c operation).
	CONNECTOR, male contact: 2 round cont; for 7½ v battery; Eby *7507.	A-battery connector.
	CONNECTOR, male contact: 3 round cont; for 45 v battery; Cinch *2730.	B-battery connector.

TU

2C
AR

C-12
100



VALUE OF TUNING CAPACITORS

C-2A	10-160	C-15A	7-35
C-2B	2.5-30	C-15B	25-160
C-2C	2.5-30	C-18A	10-160
C-5A	7-35	C-18B	2.5-30
C-5B	25-160	C-18C	2.5-30
C-8A	0-420	C-20A	50-230
C-8B	0-420	C-20B	200-560
C-8C	0-420		

Figure 9. Radio Receiver R-206A/PR, schematic diagram.